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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	IWASA, Shoji
Application No.:	10/674209
Filed:	September 29, 2003
For:	Polishing Composition and Rinse Composition
Examiner:	Michael A. Marcheschi
Group Art Unit:	1755

Mail Stop _____
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Docket No.: O11.2B-11333-US01

SWORN SUPPLEMENTAL DECLARATION OF SHUHEI YAMADA

I, Shuhei Yamada state:

(1) I am currently employed by Fujimi Incorporated as an engineer in the research and development section. I have a master's degree in materials science and engineering. By virtue of this education and experience I have sufficient credentials and expertise in the art of polymer compositions and in particular water soluble compositions comprising hydroxyethyl cellulose (HEC) and/or polyethylene oxide (PEO) to provide opinions as one of at least ordinary skill in the art.

(2) I am very familiar with the properties of water soluble polymers. I understand that the following claimed composition is excellent at reducing haze level of wafer surfaces:

HEC compounded in a composition in a quantity larger than 0.05% by weight and smaller than 2% by weight and having an average molecular weight in the range of 300,000 to 2,000,000;

PEO compounded in said composition in a quantity larger than 0.005% by weight and smaller than 0.5% by weight and having an average molecular weight in the range of 50,000 to 10,000,000;

ammonia compounded in said composition in a quantity larger than 0.02% by weight and smaller than 4% by weight;

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water; and
silicon dioxide.

(3) I have reviewed US Application 10/674209 and the claims at issue. The following additional information and tables illustrate that the inventive concept disclosed in the current claims display unexpected synergistic wafer surface haze reducing properties. Tables A, B, C, and C1-C12 were previously presented. Table D is new and contains a number of samples outside of the claimed range. Table A presents a few data points within the claimed ranges that display the unexpected synergistic results and Table B provides data points out of the claimed ranges that do not show the unexpected results. Table C provides an extensive number of additional data points within the claimed ranges controlled for each individual range defining item. Tables C1-C12 are particular data sets listed in Table C which have been isolated to clearly illustrate the high point, low point, and mid values of each or the various ranges in the claims. The observed data shown in table C is so complete and representative that it can be used to extrapolate that every possible combination according to the claimed ranges will display the unexpected synergistic results. The data in tables C, C1-C12 when contrasted with that of table B and new table D conclusively demonstrates that solutions outside of the claimed ranges will not show these same unexpected results.

(4) The explanations of tables A, B, C, and C1-C12 were previously presented. The following paragraphs explain how these tables when combined with the data in new table D demonstrate that the unexpected synergistic effect is a function of the claimed composition. Table D provides control samples for each of the five variable components of the claims. The new data demonstrates that without providing each of the elements in the claimed range, the unexpected synergism does not occur.

First Variable Component: Ammonia weight%

The instant claims recite ammonia in a range of between 0.02% and 4% by weight. Tables A, C, C1-C12, and D provide sufficient representative data to show that ammonia within this range displays unexpected synergistic effects. Table D line 3 shows the lower end of this range for one possible combination of PEO and HEC does display unexpected synergistic effects. Table D line 4 shows the upper end of this range for one possible combination of PEO and HEC also displays unexpected synergistic effects. Tables A, C, C1-C12, and D show ammonia in a middle value in the range displays unexpected synergistic effects for majority of the possible combinations

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of HEC and PEO. In addition, lines 2 and 5 in table D show that ammonia below this range (line 2) and above this range (line 5), do not display unexpected synergistic effects.

Second Variable Component: HEC weight%

The instant claims recite HEC (hydroxyethyl cellulose) in a range of between 0.05% and 2% by weight. Tables A, C-4, C-5, C-6, and D provide sufficient representative data to show that HEC within this range displays unexpected synergistic effects. These tables show that at both of the endpoints and within the claimed range of HEC with a number of PEO and ammonia combinations, unexpected synergistic effects occur. In addition, line 8 in Table D shows that HEC below the claimed range does not display unexpected synergistic effects.

Third Variable Component: PEO weight%

The instant claims recite PEO (polyethylene oxide) in a range of between 0.005% and 5% by weight. Tables A, C-10, C-11, C-12, and D provide sufficient representative data to show that HEC within this range displays unexpected synergistic effects. These tables show that at both of the endpoints and within the claimed range of PEO with a number of HEC and ammonia combinations, unexpected synergistic effects occur. In addition, lines 10 and 11 in Table D shows that PEO below the claimed range does not display unexpected synergistic effects.

Fourth Variable Component: HEC molecular weight

The instant claims recite HEC having a molecular weight in a range of between 300,000 and 2,000,000. Tables A, C-1, C-2, C-3, and D provide sufficient representative data to show that HEC within this range displays unexpected synergistic effects. These tables show that at both of the endpoints and within the claimed range of HEC with a number of PEO and ammonia combinations, unexpected synergistic effects occur. In addition, line 6 in Table D shows that HEC below the claimed range does not display unexpected synergistic effects.

Fifth Variable Component: PEO molecular weight

The instant claims recite PEO having a molecular weight in a range of between 50,000 and 10,000,000. Tables A, C-7, C-8, C-9, and D provide sufficient representative data to show that HEC within this range displays unexpected synergistic effects. These tables specifically show that PEO having a molecular weight between 80,000 and 8,000,000 with a number of HEC and ammonia combinations, unexpected synergistic effects occur. The provided data represents almost 80% of the claimed range and is sufficient to extrapolate the full breadth of the claims. In

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addition, line 10 in table D shows that below the claimed range synergistic effects occur and line 11 in Table D shows that above the claimed range no synergistic effects occur.

(5) Conclusion

The claimed composition provides excellent haze level reduction of wafer surface without deteriorating LPD and surface conditions of the wafer surface. These reduction levels occur for all possible permutations within the claimed ranges. In particular, reductions occur for all claimed weight percentages of alkaline compounds and with all kinds of alkaline compounds. This advantage is not obvious over the teachings known to others of ordinary skill in this art.

(6) Oath

I declare that all statements made herein of my knowledge and are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine and imprisonment, both under 18 U.S.C. § 1001 and that such willful and false statements may jeopardize validity of the application or any patent issued thereon.

Date: 11 Oct 2006

Signature: Shuhei Yamada

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